

Claims

What is claimed is:

1. A method for link layer device polling of a plurality of ports of one or more physical layer devices connectable to the link layer device in a communication system, the method comprising the steps of:

designating at least one of the plurality of ports as a port for which status information is to be requested by the link layer device on a more frequent basis than such information is to be requested for one or more other ports of the plurality of ports; and

polling the plurality of ports in accordance with a non-linear polling sequence such that the at least one designated port is polled more frequently than the one or more other ports.

2. The method of claim 1 wherein the status information comprises backpressure status.

3. The method of claim 1 wherein the backpressure status for a given one of the plurality of ports comprises an indicator of one of at least two states of the given port, including a backpressure assertion state and a backpressure de-assertion state indicative of the respective presence or absence of backpressure at the given port.

4. The method of claim 1 wherein the link layer device communicates with the one or more physical layer devices over an interface bus configured in accordance with an SPI-3 interface standard.

5. The method of claim 1 wherein the designated port comprises a port to which the link layer device transmits data in conjunction with a current data transfer.

6. The method of claim 1 wherein the non-linear polling sequence comprises a sequence having a plurality of polling instances in which the designated port is polled on at least every other polling instance of the sequence.

7. The method of claim 1 wherein the non-linear polling sequence comprises a sequence in which the designated port is polled on at least every other clock period of a clock of the link layer device.

5 8. The method of claim 1 wherein the plurality of ports comprises N ports, a variable i denotes a port-identifying index, $0 \leq i \leq N-1$, and the designated port is denoted as port j , $0 \leq j \leq N-1$, where $j \neq i$ and $j \neq (i+1) \bmod N$, a portion of the non-linear polling sequence comprising the sequence $i, j, (i+1) \bmod N, j$.

10 9. The method of claim 1 wherein the non-linear polling sequence is utilized only in conjunction with transfer of data from the link layer device to at least one of the plurality of ports over an interface bus.

15 10. The method of claim 1 wherein a linear polling sequence is utilized in the absence of transfer of data from the link layer device to at least one of the plurality of ports over an interface bus.

20 11. The method of claim 1 wherein the non-linear polling sequence is configured so as to reduce a status reporting latency for the designated port relative to that associated with use of a linear polling sequence.

25 12. The method of claim 1 wherein the non-linear polling sequence is configured so as to limit an amount of data transferrable by the link layer device to the designated port over an interface bus subsequent to the port entering a backpressure assertion state.

 13. The method of claim 1 wherein each of the plurality of ports comprises a port of a single physical layer device connectable to the link layer device.

14. The method of claim 1 wherein a first subset of the plurality of ports comprises one or more ports of a first physical layer device connectable to the link layer device, and a second subset of the plurality of ports comprises one or more ports of a second physical layer device connectable to the link layer device.

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15. The method of claim 1 wherein the link layer device comprises a network processor.

16. The method of claim 1 wherein the non-linear polling sequence is established in accordance with configuration information downloaded to the link layer device from an external processor.

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17. The method of claim 16 wherein the configuration information is stored in a data structure in a memory of the link layer device, the contents of the data structure defining an order in which the ports are polled in accordance with the non-linear polling sequence.

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18. The method of claim 17 wherein the data structure comprises a calendar table.

19. An apparatus for polling of a plurality of ports of one or more physical layer devices in a communication system, the apparatus comprising:

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a link layer device connectable to the one or more physical layer devices;

the link layer device being operative to designate at least one of the plurality of ports as a port for which status information is to be requested by the link layer device on a more frequent basis than such information is to be requested for one or more other ports of the plurality of ports; and

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the link layer device being operative to poll the plurality of ports in accordance with a non-linear polling sequence such that the at least one designated port is polled more frequently than the one or more other ports.

20. An article of manufacture comprising a machine-readable storage medium having one or more software programs stored therein, for use in link layer device polling of a plurality of ports of one or more physical layer devices connectable to the link layer device in a communication system, the link layer device being operative under control of the one or more software programs to perform the steps of:

designating at least one of the plurality of ports as a port for which status information is to be requested by the link layer device on a more frequent basis than such information is to be requested for one or more other ports of the plurality of ports; and

polling the plurality of ports in accordance with a non-linear polling sequence such that the at least one designated port is polled more frequently than the one or more other ports.